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EXAMINER

VINH, LAN

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| ART UNIT | PAPER NUMBER |
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1765

DATE MAILED: 08/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/358,940

Applicant(s)

LEE ET AL.

Examiner

Lan Vinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 080604. 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see pages 5-8 of the response, filed 6/8/2004, with respect to the final rejection(s) of claim(s) 1-4, 6-15 under 35 U.S.C 102(e) and 102(b) have been fully considered and are persuasive. Therefore, the final rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of US 4,395,304, US 4,443,933, US 4,721,548 and Re. 33,800.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Fornwalt et al (Re. 33,800)

Fornwalt discloses a method for electroplating using a wet etching solution containing: acetic acid/claimed organic acid and hydrofluoric acid/claimed fluoride containing solution (col 2, lines 30-34) which reads on an etchant solution consisting essentially of an organic acid and a fluorine-containing solution because "A consisting essentially of' claim occupies a middle ground between closed claims that are written in a consisting of' format and fully open claims that are drafted in a comprising' format." PPG Industries v. Guardian Industries, 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353-54

(Fed. Cir. 1998). See also *Atlas Powder v. E.I. duPont de Nemours & Co.*, 750 F.2d 1569, 224 USPQ 409 (Fed. Cir. 1984); *In re Janakirama-Rao*, 317 F.2d 951, 137 USPQ 893 (CCPA 1963); *Water Technologies Corp. vs. Calco, Ltd.*, 850 F.2d 660, 7 USPQ2d 1097 (Fed. Cir. 1988). For the purposes of searching for and applying prior art under 35 U.S.C. 102 and 103, absent a clear indication in the specification or claims of what the basic and novel characteristics actually are, "consisting essentially of" will be construed as equivalent to "comprising." See, e.g., *PPG*, 156 F.3d at 1355, 48 USPQ2d at 1355. It is noted that no patentable weight is given to the phrase "which selectively etches BPSG over TEOS" and "wherein said etchant solution exhibits a selectivity ratio of BPSG over TEOS between about 27:1 and 55:1" because the intended use of composition is not patentably significant. *In re Alberton* 141 USPQ 730 (CCPA 1964); *In re Heck* 114 USPQ 161 (CCPA 1957).

The limitations of claims 10-11 have been discussed above.

4. Claims 9-11,15 are rejected under 35 U.S.C. 102(b) as being anticipated by De Brebisson (US 4,443,933)

De Brebisson discloses a method of manufacturing a semiconductor device comprises the step of etching using a solution containing ammonium fluoride and glacial acetic acid (col 5, lines 44-47). It is noted that no patentable weight is given to the phrase "which selectively etches BPSG over TEOS" and "wherein said etchant solution exhibits a selectivity ratio of BPSG over TEOS between about 27:1 and 55:1" because

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the intended use of composition is not patentably significant. *In re Alberton* 141 USPQ 730 (CCPA 1964); *In re Heck* 114 USPQ 161 (CCPA 1957).

The limitations of claims 10-11,15 have been discussed above.

5. Claims 9-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Kern et al (US 4,395,304)

Kern discloses a selective chemical for phosphosilicate glass containing: 80 % weight acetic acid/claimed organic acid and 49% hydrofluoric acid/claimed fluoride containing solution and small fraction of water (col 2, lines 35-45) which reads on an etchant solution consisting essentially of an organic acid and a fluorine-containing solution because "A consisting essentially of" claim occupies a middle ground between closed claims that are written in a consisting of' format and fully open claims that are drafted in a comprising' format." *PPG Industries v. Guardian Industries*, 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353-54 (Fed. Cir. 1998). See also *Atlas Powder v. E.I. duPont de Nemours & Co.*, 750 F.2d 1569, 224 USPQ 409 (Fed. Cir. 1984); *In re Janakirama-Rao*, 317 F.2d 951, 137 USPQ 893 (CCPA 1963); *Water Technologies Corp. vs. Calco, Ltd.*, 850 F.2d 660, 7 USPQ2d 1097 (Fed. Cir. 1988). For the purposes of searching for and applying prior art under 35 U.S.C. 102 and 103, absent a clear indication in the specification or claims of what the basic and novel characteristics actually are, "consisting essentially of" will be construed as equivalent to "comprising." See, e.g., *PPG*, 156 F.3d at 1355, 48 USPQ2d at 1355. It is noted that no patentable weight is given to the phrase "which selectively etches BPSG over TEOS" and "wherein

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said etchant solution exhibits a selectivity ratio of BPSG over TEOS between about 27:1 and 55:1" because the intended use of composition is not patentably significant. *In re Alberton* 141 USPQ 730 (CCPA 1964); *In re Heck* 114 USPQ 161 (CCPA 1957).

The limitations of claims 10-12 have been discussed above.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kern et al (4,395,304) in view of Morimoto (US 4,721,548)

Kern etching solution has been described above. Unlike the instant claimed inventions as per claims 13-14, Kern fails to disclose the specific volume ratios of the acetic acid with the HF.

Morimoto discloses a semiconductor planarization process comprises the step of varying the volume ratio of acetic acid with HF (col 3, lines 15-17)

Thus, one skilled in the art would have found it obvious to vary the volume ratio of the acetic acid in Kern etching solution in view of Morimoto teaching because Morimoto discloses that the acetic acid is used to dilute the solution and to prevent etching of the wafer back (col 3, lines 18-20)

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8. Claims 1-3, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fornwalt et al (Re.33,800) in view of Morimoto (US 4,721,548)

Fornwalt discloses a method for electroplating using a wet etching solution containing: acetic acid/claimed organic acid and hydrofluoric acid/claimed fluoride containing solution (col 2, lines 30-34) which reads on an etchant solution consisting essentially of an organic acid and a fluorine-containing solution because "A consisting essentially of" claim occupies a middle ground between closed claims that are written in a consisting of format and fully open claims that are drafted in a comprising format." *PPG Industries v. Guardian Industries*, 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353-54 (Fed. Cir. 1998). See also *Atlas Powder v. E.I. duPont de Nemours & Co.*, 750 F.2d 1569, 224 USPQ 409 (Fed. Cir. 1984); *In re Janakirama-Rao*, 317 F.2d 951, 137 USPQ 893 (CCPA 1963); *Water Technologies Corp. vs. Calco, Ltd.*, 850 F.2d 660, 7 USPQ2d 1097 (Fed. Cir. 1988). For the purposes of searching for and applying prior art under 35 U.S.C. 102 and 103, absent a clear indication in the specification or claims of what the basic and novel characteristics actually are, "consisting essentially of" will be construed as equivalent to "comprising." See, e.g., *PPG*, 156 F.3d at 1355, 48 USPQ2d at 1355. It is noted that no patentable weight is given to the phrase "which selectively etches BPSG over TEOS" because the intended use of composition is not patentably significant. *In re Alberton* 141 USPQ 730 (CCPA 1964); *In re Heck* 114 USPQ 161 (CCPA 1957). Fornwalt discloses that the etching solution has a volume ratio of acetic acid with HF (col 2, lines 30-34)

Unlike the instant claimed inventions as per claims 1, 6, Fornwalt fails to disclose the specific volume ratios of the acetic acid with the HF.

Morimoto discloses a semiconductor planarization process comprises the step of varying the volume ratio of acetic acid with HF (25:1) (col 3, lines 15-17)

Thus, one skilled in the art would have found it obvious to vary the volume ratio of the acetic acid in Fornwalt etching solution in view of Morimoto teaching because Morimoto discloses that the acetic acid is used to dilute the solution and to prevent etching of the wafer back (col 3, lines 18-20)

The limitations of claims 2-3 have been discussed above.

Regarding claim 8, it is noted that no patentable weight is given to the phrase "wherein said etchant solution exhibits a selectivity ratio of BPSG over TEOS between about 27:1 and 55:1" because the intended use of composition is not patentably significant. *In re Alberton* 141 USPQ 730 (CCPA 1964); *In re Heck* 114 USPQ 161 (CCPA 1957).

9. Claims 1-4, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kern et al (US 4,395,304) in view of Morimoto (US 4,721,548)

Kern discloses a selective chemical for phosphosilicate glass containing: 80 % weight acetic acid/claimed organic acid and 49% hydrofluoric acid/claimed fluoride containing solution and small fraction of water (col 2, lines 35-45) which reads on an etchant solution consisting essentially of an organic acid and a fluorine-containing solution because "A consisting essentially of" claim occupies a middle ground between

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closed claims that are written in a consisting of' format and fully open claims that are drafted in a comprising' format." PPG Industries v. Guardian Industries, 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353-54 (Fed. Cir. 1998). See also Atlas Powder v. E.I. duPont de Nemours & Co., 750 F.2d 1569, 224 USPQ 409 (Fed. Cir. 1984); *In re Janakirama-Rao*, 317 F.2d 951, 137 USPQ 893 (CCPA 1963); *Water Technologies Corp. vs. Calco, Ltd.*, 850 F.2d 660, 7 USPQ2d 1097 (Fed. Cir. 1988). For the purposes of searching for and applying prior art under 35 U.S.C. 102 and 103, absent a clear indication in the specification or claims of what the basic and novel characteristics actually are, "consisting essentially of" will be construed as equivalent to "comprising." See, e.g., PPG, 156 F.3d at 1355, 48 USPQ2d at 1355. It is noted that no patentable weight is given to the phrase "which selectively etches BPSG over TEOS" because the intended use of composition is not patentably significant. *In re Alberton* 141 USPQ 730 (CCPA 1964); *In re Heck* 114 USPQ 161 (CCPA 1957).

Unlike the instant claimed inventions as per claims 1, 6, Kern fails to disclose the specific volume ratios of the acetic acid with the HF.

Morimoto discloses a semiconductor planarization process comprises the step of varying the volume ratio of acetic acid with HF (25:1) (col 3, lines 15-17)

Thus, one skilled in the art would have found it obvious to vary the volume ratio of the acetic acid in Kern etching solution in view of Morimoto teaching because Morimoto discloses that the acetic acid is used to dilute the solution and to prevent etching of the wafer back (col 3, lines 18-20)

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10. Claims 1-3, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Brebisson (US 4,443,933) in view of Morimoto (US 4,721,548)

De Brebisson etching solution has been described above in paragraph 4. Unlike the instant claimed invention as per claim 1, De Brebisson fails to disclose the specific volume ratios of the acetic acid with the HF.

Morimoto discloses a semiconductor planarization process comprises the step of varying the volume ratio of acetic acid with HF (col 3, lines 15-17)

Thus, one skilled in the art would have found it obvious to vary the volume ratio of the acetic acid in De Brebisson etching solution in view of Morimoto teaching because Morimoto discloses that the acetic acid is used to dilute the solution and to prevent etching of the wafer back (col 3, lines 18-20)

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



LV
August 20, 2004